## A World Record: Drought Turns the Missouri Ozark AmeriFlux (MOFLUX) Site into an Isoprene Volcano

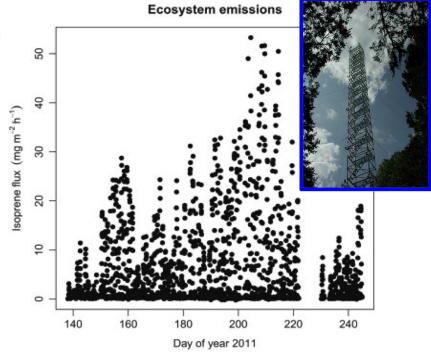
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## **Objective**

 Understand biotic and abiotic controls of forest ecosystem emissions of isoprene, an important precursor to the air pollutant ozone and to test predictive models

## **New Science**

- Isoprene emission observations were added to the longterm Missouri Ozark AmeriFlux site, a broadleaf deciduous forest
- Isoprene emission rates observed during the drought of 2011 reached 53.3 mg m<sup>-2</sup> h<sup>-1</sup> (217 nmol m<sup>-2</sup> s<sup>-1</sup>), the highest ever recorded for any ecosystem in the world
- Current models predicted isoprene emission rates before drought, but their performance deteriorated as drought progressed
- Inability of ecosystem models to predict ecosystem functions under drought is unfortunately common



## **Significance**

- Isoprene's oxidation in the atmosphere affects both the production of tropospheric ozone and secondary aerosol formation
- Isoprene production by plants is an important biosphere- atmosphere interaction with implications for the management and control of regional air quality and the aerosol formation impacting global climate change
- This study identifies areas where model improvements are needed and provides data for model testing

Citation: Potosnak MJ, LeStourgeon L, Pallardy SG, Hosman KP, Gu LH, Karl T, Gerone C & Guenther AB (2014) Observed and modeled ecosystem isoprene fluxes from an oak-dominated temperate forest and the influence of drought stress. *Atmospheric Environment* 84: 314-322.



